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Status and Relationships of the Chinese Endemic
Platycraspedum (Brassicaceae)

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ABSTRACT. The generic limits and relationships of *Platycraspedum* are discussed, and the new species *P. wuchengyii* is described. It is most closely related to *Taphrospermum*, from which it differs by having toothed filaments of median stamens, 2-lobed stigmas, palmately veined leaves, unequal sepals, and minutely reticulate seeds.

As delimited here, *Platycraspedum* O. E. Schulz consists of two Chinese species endemic to eastern Xizang (Tibet) and neighboring Sichuan. Schulz (1922) compared the generic type, *P. tibeticum*, with *Dilophia* Thomson and later (Schulz, 1936) placed both genera in the tribe Lepidieae. However, *Platycraspedum* does not have angustiseptate fruits, a feature Schulz (1936) used primarily to define the limits of Lepidieae. In our opinion, *Platycraspedum*, along with *Dilophia*, *Taphrospermum* C. A. Meyer, *Lignariella* Baehni, and several other genera, should be closely associated with *Cardamine* L., all of which share flattened replums, a feature very rare elsewhere in the Brassicaceae. The present paper does not aim to present the tribal alignments of these genera; nonetheless Schulz's (1936) placement of *Platycraspedum* in the Lepidieae is unwarranted.

Platycraspedum is most closely related to *Taphrospermum*, a genus of seven species (Al-Shehbaz,

unpublished) distributed primarily in China. Both genera have fleshy fusiform roots, a whorl of scale-like leaves at the root base, petiolate cauline leaves, bracteate inflorescences, white petals, basally dilated median filaments, and flattened replums. *Platycraspedum* is readily separated from *Taphrospermum* by its palmately veined cauline leaves and bracts, minutely reticulate seeds, strongly flattened and toothed median staminal filaments, unequal sepals with the lateral pair saccate, poorly developed lateral nectaries with the median ones lacking, and 2-lobed stigmas. By contrast, *Taphrospermum* has pinnately veined cauline leaves and bracts, foveolate or rarely papillate seeds, terete and toothless filaments, equal and nonsaccate sepals, well-developed annular lateral nectaries confluent with median ones, and entire stigmas.

Platycraspedum can easily be confused with some species of *Eutrema* R. Brown sect. *Wasabia* (Matsumura) O. E. Schulz, but it can be separated by its strongly flattened and 1-toothed median filaments, flattened replums, non-mucronate leaf teeth, sessile fruits, unequal sepals with the inner pair saccate, 2-lobed stigmas, and lack of septa. *Eutrema* has slender and toothless median filaments, terete replums, mucronate teeth or leaf-vein endings, stipitate fruits, equal sepals with the inner

pair nonsaccate, entire stigma, and complete septum.

Although the two species of *Platycraspedum* are quite different in fruit morphology (see key), we believe that their shared characters (fleshy taproots, fully bracteate inflorescences, petiolate, palmately veined cauline leaves, non-mucronate leaf marginal teeth, white flowers, unequal sepals with inner pair saccate, flattened and toothed median filaments, 2-lobed stigmas, flattened replums, absence of septa, and accumbent flattened seeds) provide ample evidence to treat them as congeneric.

Platycraspedum O. E. Schulz, *Repert. Sp. Nov. Regni Veg. Beih.* 12: 386. 1922. TYPE: *Platycraspedum tibeticum* O. E. Schulz.

Herbs biennial or perennial. Trichomes simple. Roots fusiform, fleshy. Stems erect, short, and simple at base, with several, long, decumbent to ascending branches. Basal leaves absent. Cauline leaves petiolate, repand-dentate to palmately lobed, the lobes not mucronate, base cordate. Racemes several-flowered, terminal, corymbose, bracteate throughout, elongated considerably in fruit. Sepals oblong (outer pair) or broadly ovate (inner), deciduous, glabrous, unequal, base of inner pair saccate, margins membranous. Petals white, narrowly obovate to subelliptic. Stamens 6, tetradynamous; filaments white; median pair strongly flattened, laterally 1-toothed; anthers oblong. Nectar glands 2, annular, lateral; median nectaries absent. Ovules 3 to 9 per ovary. Fruit dehiscent siliques, linear to oblong, terete or 4-angled, short stipitate; valves obscurely veined or with a prominent, narrowly winged midvein, keeled or not keeled; gynophore short and rarely to 1 mm long; replum flattened, winged or wingless; septum absent; style to 1.5 mm long; stigma 2-lobed. Seeds uniseriate, wingless, oblong to ovate, flattened; seed coat minutely reticulate, not mucilaginous when wetted; cotyledons accumbent.

KEY TO THE SPECIES OF *PLATYCRASPEDUM*

- 1a. Fruit 4-angled, narrowly 4-winged, not torulose, 2.5–3 mm wide; petals 4–6 × 2–3 mm; seeds (2.8–)3–3.5 mm long 1. *P. tibeticum*
 1b. Fruit terete, wingless, torulose, ca. 1.5 mm wide; petals 3–4 × 1–1.5 mm; seeds 2–2.5 mm long 2. *P. wuchengyii*

1. *Platycraspedum tibeticum* O. E. Schulz, *Repert. Sp. Nov. Regni Veg. Beih.* 12: 386. 1922. TYPE: China. Sichuan [as Tibet]: Tatsienlu, zwischen den Steinen des Mani auf der Passhöhe Gila, 4400 m, 4 Oct. 1914, W. Limpricht 1838 (lectotype, here designated, WRSL; isotype, WU).

Herbs (6–)10–20(–60) cm tall, glabrous or sparsely pubescent with trichomes to 0.8 mm long. Root fusiform, to 5 mm diam. Stem several-branched from single short base. Cauline leaves petiolate, glabrous or pubescent; petiole (0.1–)0.5–2(–3) cm long; leaf blade suborbicular to cordate or broadly ovate, (4–)7–15 × (1–)5–12(–15) mm, reduced in size in inflorescence, base cordate, margin repand-dentate to repand or palmately 5-lobed, the teeth or lobes not mucronate, apex obtuse. Sepals 1.5–2 × 0.8–1.5 mm, glabrous, margin membranous and to 0.2 mm wide; outer pair oblong, narrower than inner, not saccate at base; inner pair broadly ovate, saccate at base. Petals white, narrowly obovate to subelliptic, 4–6 × 2–3 mm, base cuneate, apex rounded. Filaments white, 1.1–2 mm long; outer pair slender; inner pair strongly flattened basally and 0.4–0.6 mm wide, with ovate to oblong lateral tooth 0.2–0.4 × 0.1–0.2 mm; anthers oblong, 0.4–0.6 mm long, apex obtuse. Ovary 6- to 9-ovuled. Fruiting pedicel slender, ascending to divaricate, straight to recurved, (3–)5–12(–20) mm long. Fruit narrowly oblong, 4-angled and longitudinally 4-winged, curved, not torulose, (6–)8–15 × 2.5–3 mm, base cuneate; valves glabrous, with a well-developed, winged midvein with wing to 0.5 mm wide; replum longitudinally winged with a wing to 0.5 mm; style thick, 0.5–1.5 mm; gynophore to 0.5 mm. Seeds ovate to broadly oblong, flattened, (2.8–)3–3.5 × 1.5–2 mm. Flowering June–August, fruiting July–September.

Alpine areas at 4100–4800 m.

Specimens examined. CHINA. **Sichuan:** Kanting (Tachienlu), Cheto, La, *Harry Smith 11042* (MO, S, UPS); Tatsien-lu, *Cunningham 124* (E); Tatsienlu (listed as Tibet), unter Gebüsch am Abstieg vom Passe Gila nach dem Haus Tajiatsuka, 4100 m, *Limpricht 1667* (WRSL, WU); Dawo, Felsgrate des Ressorma oberhalb des Passes Ssirka westlich Tschlisse tsung, 4840 m, *Limpricht 1931* (WRSL). **Xizang (Tibet):** Batang, Yargong, *Soulié 3088* (P); Tongolo, Kiala, *Soulié 1024* (P).

Although *Platycraspedum tibeticum* was based on three syntypes, all of which were allegedly collected from eastern Tibet (Xizang), their actual localities are in Sichuan, and perhaps for that reason the species was not included in the *Flora of Xizang* (Kuan, 1985). However, as cited above, the species does occur in Xizang. Of the three syntypes cited by Schulz (1922), *Limpricht 1838* has flowers and fruits and is herein designated as the lectotype.

The illustration of *Platycraspedum tibeticum* in Kuan (1987) is inaccurate in the number of marginal leaf teeth, as the species was shown to have up to eight marginal teeth when in fact the maximum it has is four. Furthermore, Ying et al. (1993)

incorrectly described the lateral stamens as toothed and the median ones as linear, and the reverse is correct.

2. *Platycraspedum wuchengyii* Al-Shehbaz, T. Y. Cheo, L. L. Lu & G. Yang, sp. nov. TYPE: China. Xizang: Mangkang Xian, wet grounds by river, 4000 m, 27 June 1976, *Qinghai-Xizang Expedition 12038* (holotype, KUN; isotype, PE).

Herba 5–25 cm alta. Radix fusiformis carnosae. Folia caulina petiolata, suborbiculata, cordata, vel subreniformia. Petala alba, subelliptica vel anguste oblonga, 3–4 × 1–1.5 mm. Filamenta mediana complanata, unidentata. Fructus lineares, teretes, torulosi, nonalati, 6–15 × ca. 1.5 mm. Semina oblonga, compressa, 2–2.5 × ca. 1.5 mm.

Herbs 5–25 cm tall, glabrous or sparsely pubescent with trichomes to 1 mm long. Root fusiform, fleshy, to 2 mm diam. Stem single at base, with few to several, slender, ascending to decumbent branches. Cauline leaves petiolate, glabrous or very sparsely pubescent; petiole 0.5–2.5(–4) cm long; leaf blade suborbicular to cordate or subreniform, 4–12 × 5–15 mm, reduced in size in inflorescence, base cordate, margin repand to shallowly and obtusely palmately 5-lobed, the lobes not mucronate, apex obtuse. Sepals 1–1.5 × 0.6–1 mm, glabrous, margins membranous and to 0.1 mm wide. Petals white, narrowly subelliptic to narrowly oblong, 3–4 × 1–1.5 mm, base cuneate, apex rounded. Filaments white, 1.1–1.5 mm long; outer pair slender; inner pair strongly flattened basally and 0.3–0.5 mm wide, with ovate to oblong lateral tooth to 0.2 × 0.1 mm; anthers oblong, 0.3–0.4 mm long, apex obtuse. Ovary 3- to 6-ovuled. Fruiting pedicel slender, ascending to divaricate, straight, 5–15 mm long. Fruit linear, terete, wingless, torulose, 6–15 × ca. 1.5 mm, base cuneate; valves sparsely and minutely puberulent, obscurely veined, wingless; replum wingless; style thick, 0.5–1.5 mm; gynophore to 1 mm. Seeds oblong, flattened, 2–2.5 × ca. 1.5 mm. Flowering June–August, fruiting July–August.

Wet grounds by rivers, slopes of ravines in *Juniperus* forests, and woods at 4000–4500 m.

Paratypes. CHINA. **Sichuan:** Upper Yalong basin, Chola Shan, Dege-Garze, Manigango, 31°52'N, 99°07'E, G. & S. Miehe & Wündisch 94-433-22 (GOET); Deige Xian, Babang Xiang, *Anonymous 7389* (PE #1137899).

Platycraspedum wuchengyii is named in honor of Wu Zhengyi (Wu Chengyi), Director Emeritus of the Kunming Institute of Botany, Editor-in-Chief of the Chinese *Flora Reipublicae Popularis Sinicae*, and Co-chair of the *Flora of China*, in recognition of his outstanding contributions to the flora of China. Professor Wu annotated the holotype of *P. wuchengyii* as *P. tibeticum*.

Two collections, the type and *Anonymous 7389* (PE #1137899), were cited by Wang (1993) as *Platycraspedum tibeticum*. It appears that the remarkable differences in the fruits of the two species (see key) were overlooked.

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